INTRODUCTIONS

Study Team

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Subconsultant
AGENDA

- Study Overview
- Corridor Context
- Screening of Technologies
- Final Recommendations
- Implementation Plan
STUDY OVERVIEW
STUDY OVERVIEW

Study Funding

Livable Centers Initiative (LCI) Grant (80%)

Local Match (20%)
STUDY OVERVIEW
Virginia Ave. from Main St./US 29 to South Central Ave.
STUDY OVERVIEW

What Are We Trying to Improve with Technology?

Safety
Mobility
Walkability
WHAT TYPES OF SOLUTIONS DID WE REVIEW?

- Signals
- Bikes/Pedestrians
- Transit
- Street Lights
- Pavement/Sidewalks
- Wayfinding
- Parking
- EV Charging
- Video Surveillance
- Wi-Fi
- Curbside
- Apps
- Data Exchange
WHAT TYPES OF SOLUTIONS WILL WE BE EVALUATING?
STUDY OVERVIEW

Schedule

- **Jan-Feb ‘19**: Public Meeting
- **Mar-Apr**: Existing Conditions & Needs Assessment
- **May-Jul**: Public Meeting
- **Jul-Aug**: Preliminary Recommendations
- **Sept ‘19**: Final Recommendations & Implementation Plan

Activities:
- **Jan-Feb ‘19**: Public Meeting
- **Mar-Apr**: Update Project Prioritization Framework & Develop Menu of Strategies
- **May-Jul**: Best Practices and Trends & Strategy Evaluation
- **Jul-Aug**: Preliminary Recommendations

Inbox:
- **Sept ‘19**: Final Recommendations & Implementation Plan

Notes:
- **Virginia Avenue SMART CORRIDOR**
By the Numbers…

- 2 Public Meetings
- 66 Attendees
- 2 Facebook Lives
  - 687 Reaches
  - 329 Views
  - 124 Engagements
- 1 Online Survey
  - 76 Responses
- 1 Flyover Video
- 1 Digital Billboard
CORRIDOR CONTEXT
CORRIDOR CONTEXT
Demographics

11,000 People Within 1 Mi. of Virginia Ave.

Data Source: Population within 1 mile buffer of Virginia Avenue; EPA EJSCREEN Report, Version 2018
CORRIDOR CONTEXT
Demographics

Minority Population: 70%
Low-Income: 47%
> 64 Years Old: 9%

Data Source: Population within 1 mile buffer of Virginia Avenue; EPA EJSCREEN Report, Version 2018
CORRIDOR CONTEXT

Demographics

- Modest Income Homes
  - Faith and family
  - Don’t use credit
  - Pay in cash
  - ≤1 vehicle/household

- Metro Fusion
  - Impressed by electronics
  - Young and diverse
  - Social status important

Data Source: ESRI Tapestry
CORRIDOR CONTEXT

Demographics

12,000 Total Employees

- Total Crashes: 588

Legend:
- Crash Event
- East Point
- Hapeville
- College Park
- High Number of Crash Events
- Low Number of Crash Events
- Railroads
- Airport
- Water Body

Virginia Ave Smart Corridor Study Limits

Hartsfield-Jackson Atlanta International Airport

Source: Georgia DOT, Georgia DOT, Georgia DOT, Georgia DOT, Georgia DOT, Georgia DOT, Georgia DOT.
Virginia Ave. Area Crime
4-5x National Crime Index
3-11% Trucks Along Virginia Ave.
10 Total Intersections
4 Maintaining Agencies
2 Up to Current GDOT Software & Equipment Standards
8 Operating w/Older Software and Signal Equipment
1 Includes communication capabilities
9 Include pedestrian signal heads and push buttons
SCREENING OF TECHNOLOGY APPLICATIONS
Technology applications to address safety, walkability and mobility.

Full Universe of Applications (32)
Technology applications not eliminated due to high cost and/or maintenance requirements or redundancy.

21 Applications Further Evaluated
Technology applications not part of larger regional context.

28 Applications Within Scope of Corridor
Moved forward to recommended phasing plan based on expected outcomes, project readiness, sustainability technology, etc.

15 Applications Recommended in Tiers 1 & 2
APPLICATIONS OUTSIDE THE SCOPE OF THE CORRIDOR

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Requires Larger Regional Conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time transit data and systems coordination</td>
<td>The ATL Authority cleaning up GTFS feed data first</td>
</tr>
<tr>
<td>Mobility as a Service (MaaS)</td>
<td>The ATL Authority may lead a pilot after GTFS feed data cleaned up</td>
</tr>
<tr>
<td>Integrated system and data exchange</td>
<td>Requires larger regional conversation</td>
</tr>
<tr>
<td>Extreme weather alert systems</td>
<td>Requires larger regional conversation</td>
</tr>
</tbody>
</table>
APPLICATIONS ELIMINATED FROM FURTHER EVALUATION
## APPLICATIONS ELIMINATED FROM FURTHER EVALUATION

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Reason for Elimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunshot detection sensors</td>
<td>High cost and unproven effectiveness to date</td>
</tr>
<tr>
<td>Solar pavement</td>
<td>High cost and maintenance requirements</td>
</tr>
<tr>
<td>Countdown pedestrian signals</td>
<td>Do not provide advanced warning to vehicles and not accessible to the visually impaired</td>
</tr>
<tr>
<td>Detector-based adaptive signal control technologies (ASCT)</td>
<td>Requires vehicle to drive over detector; high installation and maintenance cost</td>
</tr>
<tr>
<td>Roadside sensors</td>
<td>High cost; desired outcomes can be achieved with other technologies</td>
</tr>
<tr>
<td>Navigation assistance for the visually impaired</td>
<td>Devices worn by the visually impaired and do not require any infrastructure improvements</td>
</tr>
<tr>
<td>Artificial Intelligence (AI) Conversation Agent</td>
<td>Requires daily maintenance</td>
</tr>
</tbody>
</table>
APPLICATIONS MOVED FORWARD FOR FURTHER EVALUATION
APPLICATION DESCRIPTION:
Traffic signal priority is an operational strategy to reduce the delay to transit vehicles at signalized intersections. This requires communication between the transit vehicles and the traffic signals to alter the signal timings to favor the transit operations.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE Cellular

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Corridor-wide at all signalized intersections.

DEPLOYED IN OTHER CITIES:
- Candler Road and Buford Highway in Metro Atlanta
- City of Los Angeles

PROJECT PRIORITIZATION:

PROJECT SCORE: 80.5

APPROXIMATE COST:
- Cost per Location: $13,500 per intersection for detection and equipment.
- Total Cost: $135,000 for 10 signalized intersections.
- Other Cost Considerations: $75 per transit vehicle for transponders.
APPLICATION DESCRIPTION:
Traffic signal pre-emption or prioritization is a system that allows the normal operation of traffic signals to be deterred. The Manual on Uniform Traffic Control Devices (MUTCD) defines traffic signal pre-emption as "the transfer of normal operation of traffic control signal to a special mode of operation".

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE Cellular

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Corridor-wide at all signalized intersections

DEPLOYED IN OTHER CITIES:
- Intersection and corridor deployments throughout Metro Atlanta (Alpharetta, Dunwoody, Gwinnett County, and Marietta)

PROJECT PRIORITIZATION:

PROJECT SCORE: 73.0

APPROXIMATE COST:
- Cost per Location: $5,000 per intersection for equipment
- Total Cost: $50,000 for 10 signalized intersections
- Other Cost Considerations: $2,500 per emergency vehicle
APPLICATION DESCRIPTION:
Bicycle detection is used at actuated signals to alert the
signal controller of bicycle crossing demand on a particular
approach. Bicycle detection occurs either through the use
of push-buttons or by automated means.

TELECOMMUNICATION REQUIREMENTS:
- 5G Cellular, and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Bobby Brown Parkway (East Point Path #8)
- N & S Central Avenues, International Blvd/Delta Blvd,
  and Madison Street

DEPLOYED IN OTHER CITIES:
- Atlanta, GA; Austin, TX; Portland, OR; Berkley, CA;
  Washington, DC; Denver, CO; Minneapolis, MN; San
  Francisco, CA; Seattle, WA; Vancouver, BC

PROJECT PRIORITIZATION:

PROJECT SCORE: 67.5

APPROXIMATE COST:
- Cost per Location: $2,000 - $20,000
- Total Cost: $20,000 - $200,000 (4 locations)
- Other Cost Considerations:
  additional costs depending on detection technology and/or existing
  controller capabilities
APPLICATION DESCRIPTION:
CV-based ASTC systems can provide real-time spatial information (such as, position, speed, and acceleration and other traffic data) necessary for evaluating traffic conditions on a road network. Communications between a vehicle and infrastructure enables the intersection controller to obtain much more detailed information of the surrounding vehicle states within the transmission range.

TELECOMMUNICATION REQUIREMENTS:
- 5G Cellular, and/or
- DSRS

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Corridor-wide at all signalized intersections

DEPLOYED IN OTHER CITIES:
- North Ave Smart Corridor, Atlanta, GA
- Portland, ME
- Quincy, MA

PROJECT SCORE: 67.0

APPROXIMATE COST:
- Cost per Location: $25,000 per signalized intersection for equipment and engineering for controller set-up
- Total Cost: $250,000 for 10 signalized intersections
APPLICATION DESCRIPTION:
In-pavement illuminated pedestrian crosswalks are crosswalks that are embedded with amber lights on both sides of the crosswalk and oriented to face oncoming traffic. The warning lights could produce a bright, daytime-visible light focused directly in the driver’s line of sight clearly indicating the curve, hazard, crosswalk, variable lane, or lane edge.

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Anywhere near bus stops with intersection crosswalks

DEPLOYED IN OTHER CITIES:
- Rock Island Rail Trail, Amarillo, TX
- Pasco, Washington

PROJECT PRIORITIZATION:

PROJECT SCORE: 66.3

APPROXIMATE COST:
- A system with 10 In-Roadway Warning Lights, 2 signs, A/C power and push button activation starts at cost of $11,800, price could go higher for system upgrade and more functions.
APPLICATION DESCRIPTION:
Solar bus shelters are bus shelters powered by the sun to provide shelter, air conditioning, USB charger ports, digital transit maps, and/or in some areas, free Wi-Fi.

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Retrofit the existing bus shelter to solar-powered bus shelter.
- Install two new solar bus shelters along the corridor, possibly one located at the eastern side of the corridor (near hotels and restaurants) and one located in the western side of the corridor (in the center of residential area).

DEPLOYED IN OTHER CITIES:
- Hialeah, FL
- Miami, FL
- Corona, CA
- Dubai, UAE

PROJECT PRIORITIZATION:

PROJECT SCORE: 66.0

APPROXIMATE COST:
- The estimated cost for an air-conditioned shelter is about $65,000 per unit.
- The costs for open-air shelters with rooftop solar panels could vary according to different manufacturers and different technological standards.
APPLICATION DESCRIPTION:
A RRFB (Rectangular Rapid Flashing Beacon) or PHB (Pedestrian Hybrid Beacon) is a pedestrian-activated signal that uses flashing and solid lights to improve roadway crossing safety. When activated, the signal immediately flashes yellow to alert drivers before changing to a red stop light. When vehicles are stopped, pedestrians are given a Walk signal.

TELECOMMUNICATION REQUIREMENTS:
- 5G Cellular
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Between Harrison Rd and I-85 On/Off Ramps
- Between Northbound I-85 Ramp and Delta Blvd

DEPLOYED IN OTHER CITIES:
- Atlanta, Brookhaven, Chamblee, & Doraville, GA
- Tucson, AZ; Detroit, MI; Columbus, OH

PROJECT PRIORITIZATION:
- Stakeholder Input
- RO&E Economic Benefits
- Safety Cost
- Environment & Public Health
- Sustainable Technology

PROJECT SCORE: 65.3

APPROXIMATE COST:
- Cost per Location: $80,000 - $130,000 (PHB), $4,500-52,000 (RRFB)
- Total Cost: $160,000 - $260,000 (2 PHB locations)
- Other Cost Considerations: median/refuge island construction, additional signage, and/or striping
APPLICATION DESCRIPTION:
Vehicle to Pedestrian (V2P) warning systems are used to detect pedestrians as well as bicycles, wheelchairs and other items in the area surrounding a bus. They include warning systems that send alerts to drivers and to pedestrians via their smartphones. Buses have to be equipped with On-Board Units and Road-Side Unites and sensors are also required.

TELECOMMUNICATION REQUIREMENTS:
- 5G Cellular
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Insert specific location 1
- Insert specific location 2
- Or indicate if corridor-wide, including x intersections or x bus stops, etc.

DEPLOYED IN OTHER CITIES:
- Adelaide, Southern Australia

PROJECT SCORE: 64.8
APPROXIMATE COST:
- The cost of a MobileEye installation (including all equipment and cabling) is about $6,000 per vehicle (average).
APPLICATION DESCRIPTION:
Smart streetlights implement multiple technologies at one location, including sensors for on-demand lighting, audio systems for public alerts, accident and traffic monitoring, and potential electric car charging, security cameras, parking assistance, signal management, and public Wi-Fi access. Sensors and Road Side Units are necessary for smart streetlights.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE/3G Cellular and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Insert specific location
- Or indicate if corridor-wide, including x intersections or x bus stops, etc.

DEPLOYED IN OTHER CITIES:
- Sydney, Australia
- Dubai, UAE
- London, England
- Cardiff, Wales, England

PROJECT PRIORITY RATING:
- Stakeholder Interest
- Mobility Options
- Economic Benefits
- Environment & Public Health
- Sustainable Technology

PROJECT SCORE: 64.8

APPROXIMATE COST:
- Cost varies significantly based on functions and whether it is retrofitting an existing streetlight or installing a new streetlight.
- Retrofitting traditional streetlights could cost from $200 to $2,000 each, with another $150 for internet and network connections.
APPLICATION DESCRIPTION:
Digital wayfinding kiosks are means for replacing traditional printed signage with interactive digital screens and methods. They are commonly used to automate the direction of pedestrians to their destinations, assist them with questions, and provide other essential information. They could be customized to provide specific services.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE Cellular

POTENTIAL LOCATIONS ALONG CORRIDOR:
- At the eastern side of the corridor, near the hotel and restaurant zone (Harrison Road and Bobbi Brown Parkway)

DEPLOYED IN OTHER CITIES:
- H-JAIA, Atlanta, GA
- Georgia World Congress Center, Atlanta, GA
- Emory University Hospital Midtown, Atlanta, GA
- Big Bang Pizza, Brookhaven, GA
- Munich Airport, Germany

PROJECT PRIORITIZATION:

PROJECT SCORE: 64.8

APPROXIMATE COST:
- Costs vary depending on level of intelligence and different functions and services provided.
- Digital wayfinding kiosks can cost from $20,000 for a single exterior wayfinding sign to $200,000 for an interior system.
- Soolf signs have been free in the Atlanta region with paid advertising covering installation and maintenance.
APPLICATION DESCRIPTION:
Wi-Fi connectivity is foundational to Smart City and Corridor deployments. Lack of internet access has implications for providing wide-spread services and addressing digital equity.

TELECOMMUNICATION REQUIREMENTS:
- WiFi 6 (IEEE 802.11ax)

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Approximately every 1000 ft. along the corridor and other selected sites as needed

DEPLOYED IN OTHER CITIES:
- Downtown Decatur, GA
- New York, NY
- Boston, MA

PROJECT PRIORITIZATION:

PROJECT SCORE: 49.8

APPROXIMATE COST:
- Cost per Location: $3,400 per WiFi Access Point
- Total Cost: $54,000 for estimated 16 AP sites plus the other costs below
- Other Cost Considerations: $25,000 for network equipment and ISP interconnection
APPLICATION DESCRIPTION:
Automatic license plate readers (ALPRs) are stationary units attached to poles along the street to monitor traffic, enforce parking, and monitor crimes, in addition to other uses. They capture images of passing license plates, vehicles, and sometimes the driver and passengers, along with location and time and date stamp. The information is stored in databases accessible by law enforcement, as well as the private companies that collect the data.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE/5G Cellular, and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Insert specific location
- Or indicate if corridor-wide, including x intersections or x bus stops, etc.

DEPLOYED IN OTHER CITIES:
- As of July 2012, it was being used in 38 states in the U.S., including the state of Georgia.

PROJECT PRIORITIZATION:

PROJECT SCORE: 49.3

APPROXIMATE COST:
- License plate reader camera costs can vary due to different manufacturers and different technological standards, which could vary from approximately $200 to $1,000. A higher-resolution camera would cost more.
APPLICATION DESCRIPTION:
Autonomous shuttles are vehicles that move small amounts of passengers (5-12) approximately 1 mile on a set route, and without a driver. Autonomous shuttles use guidance and detection systems using a combination of sensors, cameras, and deep learning programs.

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Specific routing would be developed as part of future transit planning efforts to tie into AADTs' Transit Master Plan and Automated Driving System (ADS) grant application if successful
- Likely located on eastern end of corridor near hotels

DEPLOYED IN OTHER CITIES:
- Las Vegas, NV
- Ann Arbor, MI
- Detroit, MI
- Denver, CO
- Columbus, OH

PROJECT PRIORITIZATION:

PROJECT SCORE: 48.3
APPROXIMATE COST:
- Costs vary greatly based on whether the equipment is leased or purchased, the number of vehicles, whether infrastructure already exists, and related research costs.
- One pilot program in Arlington, TX, leasing 2 shuttles for a period of 6 months, costs around $770,000.
APPLICATION DESCRIPTION:
Traffic monitoring software is technology that can be added to existing camera surveillance to automatically record traffic flow, accidents, and incidents in real-time and extract data using set parameters. Using intelligent sensors and algorithms, these systems can also send out immediate alerts which are visually verifiable.

TELECOMMUNICATION REQUIREMENTS:
- 4G/LTE/5G Cellular; and/or
- DSRC

DEPLOYED IN OTHER CITIES:
- Arizona is using thermal imaging cameras to detect wrong-way traffic.
- Ontario, Canada temporarily used it prior to the 2015 Pan American Games
- San Paolo, Brazil

PROJECT PRIORITIZATION:

PROJECT SCORE: 47.0
APPROXIMATE COST:
- The pilot program in Arizona for detecting wrong way costs $3.7 million to install 90 thermal cameras along a 15-mile road.
- ITSJPO in USDOT provides detailed cost information on traffic cameras, which is about $5000 for capital cost and $2000 for operation and management cost per unit.
APPLICATION DESCRIPTION:
Smart solar benches are new urban furniture pieces that will help cities, universities, retail, or business centers to create better, safer, and more user-friendly environments. They are powered by solar and it could offer functions such as charging, advertisement and information display.

TELECOMMUNICATION REQUIREMENTS:
- Not required

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Near bus stops with no bus shelters

DEPLOYED IN OTHER CITIES:
- First list if deployed anywhere in Atlanta region
- Then indicate if anywhere in U.S. and where
- If none, indicate if international and where
- If none, indicate "no known deployments domestically or internationally"

PROJECT PRIORITIZATION:

PROJECT SCORE: 46.8

APPROXIMATE COST:
- Approximately $3,000 per unit
APPLICATION DESCRIPTION:
Real-time parking availability apps serve to inform drivers of available parking spaces based on street-level sensors that detect when a space becomes available.

TELECOMMUNICATION REQUIREMENTS:
- Satellite

POTENTIAL FUNCTIONS:
- Parking space availability, rates, and hours of operation
- Curb space availability
- Plan, ticket, and pay across modes, operators, and jurisdictions (Mobility as a Service)

POTENTIAL APPS TO COORDINATE WITH:
- Publicly Owned:
  - MARTA On the Go
  - OneBusAway
  - ATL MaaS pilot expected in 2020
- Privately Owned
  - Park Mobile
  - BestParking
  - ParkWhiz

PROJECT PRIORITIZATION:

PROJECT SCORE: 46.0

APPROXIMATE COST:
- Developing an app which includes GPS and map, drive planning, carpooling options, and some other functions usually requires up to thousand hours of work of productivity, and the average cost of developing could be around $30,000 to $40,000.
APPLICATION DESCRIPTION:
Smart parking meters are automated parking systems which allow for a self-parking, paperless system aimed at making parking easier for cities and drivers. They work in conjunction with parking apps, street sensors and/or mounted cameras.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE/5G Cellular; and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Near restaurant and hotel zone with higher volume of traffic

DEPLOYED IN OTHER CITIES:
- Smart parking meters are located in almost every major U.S. city, with 73.9 million smart meters installed throughout the United States, as of 2017.
APPLICATION DESCRIPTION:
Electric vehicle (EV) charging stations are infrastructures that can charge the battery of electric vehicles. At present there are three levels of EV charging stations:
- Level 1 delivers 2 to 5 miles of range per hour of charging (low efficiency, usually used at home)
- Level 2 delivers 10 to 60 miles of range per hour of charging (for both residential and commercial use)
- Level 3 delivers 180 to 300 miles of range per hour of charging (only for commercial and industrial use)

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Eastern end of corridor near hotels and restaurants

DEPLOYED IN OTHER CITIES:
- In Georgia State, there are almost 800 charging stations and over 2,400 charging outlets.
- In United States, there are almost 22,000 charging stations and over 63,000 charging outlets.
- In Hounslow, London, there are EV charging outlets installed in light poles along the curb.

PROJECT PRIORITIZATION:

PROJECT SCORE: 40.8

APPROXIMATE COST:
- For Level 2 charging stations, the station cost varies from $500 to $700, with parts and labor costing $1,200 to $2,000.
- For Level 3 charging stations, the station cost varies from $1,000 to $2,000, with parts and labor costing $2,300 to $5,000.
- There would be an increase in costs and installation fees if service panels need to be updated.
APPLICATION DESCRIPTION:
Automated parking systems (APS) serve to park automobiles automatically so as to lessen the surface area needed for parking vehicles and to maximize convenience and safety.

TELECOMMUNICATION REQUIREMENTS:
- Not required

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Eastern end of corridor near hotels and restaurants

DEPLOYED IN OTHER CITIES:
- New York, NY (Parkmatic Quadstackers System)
- Honolulu, HI (Parkmatic 10-Car Rotary System (Carousel) with outer turntable)
- San Francisco and Oakland, CA
- Germany
- Japan
- China

PROJECT PRIORITIZATION:

PROJECT SCORE: 36.5

APPROXIMATE COST:
- Total costs for stand-alone, above-grade automated parking stall is about $20,000.
- Total costs for below-building, above-grade automated parking stall is about $30,000.
- Total costs for below-building, below-grade automated parking stall is about $35,000.
APPLICATION DESCRIPTION:
Curbside occupancy sensors can be installed in the pavement along the curb to determine if the curb is occupied. Coupled with the sensors, over time, large data streams could enable apps and platforms to inform users if a specific space is open or occupied and predict when it would become available if it’s occupied. Information could be displayed and sent to users and drivers through a web-based or mobile-based platform to give suggestions on real-time parking decisions.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE/5G Cellular, and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Near the hotel and restaurant zone.

DEPLOYED IN OTHER CITIES:
- Curbside Flex Zones, Seattle, Washington
- Innovative Curbside Management, Washington, DC
- Curbside Management, San Francisco, CA

PROJECT PRIORITIZATION:

PROJECT SCORE: 38.3

APPROXIMATE COST:
- The costs of occupancy sensors could vary from $500 to $10,000 per sensor based on different distance standards. Programming occupancy sensors to specific requirements could add to the cost.
APPLICATION DESCRIPTION:
Smart dots in centerlines are small devices installed at the centerline of roads to provide illumination and communication with vehicles and infrastructure in a connected transportation system to send a variety of crucial basic alerts to drivers and passengers including fog, black ice, upcoming road incidents, and erratic drivers.

TELECOMMUNICATION REQUIREMENTS:
- 4G LTE/5G Cellular, and/or
- DSRC

POTENTIAL LOCATIONS ALONG CORRIDOR:
- Possibly along the whole Virginia Avenue

DEPLOYED IN OTHER CITIES:
- The WazeWay’s pilot project is located next to the Georgia Visitor Information Center on The Ray (I-85)

PROJECT PRIORITIZATION:

PROJECT SCORE: 35.6

APPROXIMATE COST:
- Cost not available
FINAL RECOMMENDATIONS
FINAL RECOMMENDATIONS

Project Prioritization Framework

- **Stakeholder Input**
  - Community and/or stakeholder priorities

- **Return on Investment & Economic Benefits**
  - Jobs created, aesthetics, economic competitiveness

- **Safety**
  - Anticipated crash and/or crime reduction, safe connections for schools and/or EMS.

- **Cost**
  - Relatively lower cost projects which could be low-hanging fruit

- **Project Readiness**
  - GDOT permit requirements, telecommunications availability, MUTCD-compliant, procurement

- **Mobility Options**
  - Congestion, improves transit, bike, and/or pedestrian amenities and/or service

- **Environment & Public Health**
  - Anticipated emissions reduction, active transportation

- **Sustainable Technology**
  - Interoperability (communicates with most technologies); multi-functionality; maintenance requirements; not likely to be outdated within a few years
PRELIMINARY RECOMMENDATIONS
Multiple Weighting Scenarios

Public Survey Responses (76)

User Defined Weighting Scenario
# FINAL RECS

## Outside Scope of the Corridor
- 01. Real-time Transit Data
- 02. Mobility as a Service
- 03. Integrated System and Data Exchange
- 04. Extreme Weather Alert Systems

## Eliminated from Further Consideration
- 01. Gunshot Detection Sensors
- 02. Solar Pavement
- 03. Countdown Pedestrian Signals
- 04. Detector-based Adaptive Signal Control Technologies
- 05. Roadside Sensors
- 06. Navigation Assistance for the Visually Impaired
- 07. Artificial Intelligence (AI) Conversation Agent

## Included in Tier 3 to Revisit Later
- 01. Parking Availability/Availability App
- 02. Smart Parking Meter(s)
- 03. EV Charging Station(s)
- 04. Automated Parking System(s)
- 05. Curbside Occupancy Sensors
- 06. Smart Dots (Studs) in Street Centerlines

## Recommended (Prioritized in Tier 1)
- 01. Transit Signal Priority
- 02. Emergency Vehicle Signal Pre-emption
- 03. Bike Signal Detection
- 04. Adaptive Signal Control Technology
- 05. In-Pavement Illuminated Crosswalks
- 06. Solar Bus Shelter(s)
- 07. RRFB/PHB with Automated Options for Activation
- 08. Transit - Pedestrian Warning System
- 09. Smart Streetlighting
- 10. Digital Wayfinding Kiosk(s)

## Recommended (Prioritized in Tier 2)
- 11. Public Wi-Fi
- 12. Camera/License Plate Readers
- 13. Driverless Shuttle
- 15. Solar Bench(es)
15 APPLICATIONS INCLUDED IN FINAL RECOMMENDATIONS
Tier 1 Projects
FINAL RECOMMENDATIONS

Tier 1 Projects

- Transit Signal Priority
- Emergency Vehicle Signal Pre-emption
- Bike Signal Detection
- Adaptive Signal Control Technology
- In-Pavement Illuminated Crosswalks
- Solar Bus Shelters
FINAL RECOMMENDATIONS
Tier 1 Projects

- Rectangular Rapid Flashing Beacons for Mid-block Crossings
- Transit-Pedestrian Warning System
- Smart Streetlighting
- Digital Wayfinding Kiosk(s)
Tier 2 Projects
FINAL RECOMMENDATIONS
Tier 2 Projects

- Public Wi-Fi
- Cameras
- Driverless Shuttle
- Automated Traffic Monitoring/Object Detection
- Solar USB Charging Bench(es)
EARLY WINS!

GDOT Upgrade of Signals to MaxTime & Installation of 4G LTE Cellular Radios - COMPLETE!

Building the Foundation for Future Signal Enhancements

- MaxTime local controller software / MaxView remote signal management software
- Cabinet Compatibility Upgrades
- Software with additional functions (ex. CV, TSP, etc.)
- Communications (4G-LTE Cellular Radios)
- Current Traffic Signal Cabinets (Hardware)
PHASING PLAN - EARLY WIN UPDATE
GDOT Upgrade of Signals to MaxTime & Installation of 4G LTE Cellular Radios

STEP 1: Install Communications between Signals and Traffic Management Center
STEP 2: Install Communications between Signals and Transit (Signal Priority) and Emergency Vehicles (Signal Pre-emption)
EARLY WINS!
C-V2X Cellular Radio Installation and Signal Priority / Pre-emption

Kerry Armstrong & ARC spearheads metro-wide deployment of C-V2X at 1,000 signals.

GDOT updating policy guidance to allow BOTH C-V2X and DSRC at same intersection.

01 METRO C-V2X
02 PILOT APP
03 AACIDs C-V2X
04 GDOT POLICY
05 PARTNERSHIPS

Virginia Avenue Smart Corridor Team identifies need for DSRC v. C-V2X pilot and submits application to ARC.

AACIDs submits 72 signals for C-V2X deployment, including all of Virginia Avenue, and collaborates with locals.

Locals & AACIDs pay for signal pre-emption and priority installation & years 1-3 of maintenance; ARC pay for C-V2X routers & years 4-5 of maintenance.
EARLY WINS!
DSRC Radio Installations

- GDOT willing to consider donating and installing DSRC radios at 2-3 intersections along the corridor
- I-85 ramp intersection
- Other potential locations TBD
EARLY WINS!
MARTA Transit Vehicle Testing

- If we provide the technology, MARTA willing to provide:
  - Non-revenue service test vehicle (MARTA Mobility van) along Virginia Avenue
  - Revenue-service 3+ month pilot (Bus 172 is 1 of 140 buses serving 37 routes out of Hamilton Garage)
IMPLEMENTATION PLAN
Funding, Phasing, Action Plan
IMPLEMENTATION PLAN

Approach to Funding Strategy

**Step 01**
Recommended Projects
- Prioritized projects from Priority Tiers 1 and 2.

**Step 02**
Funding Sources
- Identified full universe of potential funding sources for smart corridor projects.

**Step 03**
Packaging of Projects
- Combine projects into packages for funding applications based on funding cycles and project readiness.

**Step 04**
Phasing Plan
- Incorporate packages into phasing plan and 100-day action plan.
IMPLEMENTATION PLAN

Universe of Funding Sources

Potential Smart Mobility Funding Sources

- Federal Competitive Grants
  - BUILD (FHWA/FTA); Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) (FHWA); Accelerated Innovation Deployment (AID) Demonstration (FHWA); Automated Driving Systems (ADS) Grant (FHWA); Safety Research & Demonstration (SRD) (FTA); Integrated Mobility & Innovation (IMI) Demonstration (FTA);
  - Senior Corps RSVP Grants (Corp, for National & Community Service).

- GDOT Grants & Funds
  - Off-System Safety (OSS) Improvement Grant; Quick Response (QR) Funds; Local Maintenance & Improvement Grant (LMIG); Safe Routes to School (SRTS).

- Atlanta Regional Commission
  - Livable Communities Initiative (LCI), Community Development Assistance Program (CDAP), Smart Communities Challenge.

- FAST Act - Federal Aid
  - National Highway Performance Program (NHPP); Surface Transportation Block Grant (STBG); Highway Safety Improvement Program (HSIP), Congestion Mitigation & Air Quality (CMAQ) Improvement Program.

- SRITA
  - Georgia Transportation Infrastructure Bank (GTIB) Loan/Grant.

- Local
  - Cities of College Park, East Point, and Hapeville; AWCID; TSPLOST, Hotel-Motel Excise Tax, PATH Foundation; Private Partnerships (ex. Delta, Technology Vendors, Georgia Power).
IMPLEMENTATION PLAN

Packaging of Projects

**Package 1A:**
Upgrade Signals with 4G LTE Routers and Install MaxTime/MaxView Software at All 10 Traffic Signals

**Package 1B:**
Digital Wayfinding Kiosks (near hotels)

**Package 1C:**
CV1k+ Initiative – Install DSRC/CV2X Routers, Transit Signal Priority, and Emergency Vehicle Signal Pre-emption at All 10 Traffic Signals

**Package 1D:**
GTIB Grant Application – Pilot 1-2 In-Pavement LED Illuminated Crosswalks (near hotels), 1-2 RRFP with Automated Options (near Woodward Academy), 1-2 Bike Signal Detection, Solar USB Charging Benches, Transit Pedestrian Warning System
100-DAY ACTION PLAN

100-Day Action Plan

- **Upgrade 10 Traffic Signals with Telecommunications and Synchronize.**
  - Install 4G LTE routers and MaxTime/MaxView software and real-time signals.

- **Host MaxTime/MaxView Training for Cities.**
  - Host training for Cities of College Park, East Point, and Hapeville (scheduled for 10/1/19 – 10/3/19).

- **Apply for Funding for Overall Corridor Scoping Study and Telecommunications Pilot Study.**
  - Respond to ARC TIP Solicitation (applications due 10/11/19) to fund Scoping Study, including Concept of Operations, and Telecommunications Pilot Study (performance measures study; not equipment).

- **Apply for Funding for Phase 1D Projects.**
  - Respond to Georgia Transportation Infrastructure Bank (GTIB) Grant/Loan Program (applications due 10/15/19) to fund implementation of in-pavement LED illuminated crosswalks, rectangular rapid flashing beacons, transit pedestrian warning systems, bike signal detection, and solar USB charging benches.

- **Coordinate with Partners on Phase 1C Projects as part of CV1k+ Initiative.**
  - Coordinate funding commitments, roles, and responsibilities and GDOT permits for 2020 deployment of Dedicated Short-Range Communications and cellular routers, transit signal priority, and emergency vehicle signal pre-emption.

- **Call/Meet with GDOT D7 to Discuss Permitting Process for Phase 1D Projects.**
  - GDOT permits are required for the following projects within Phase 1D: in-pavement LED illuminated crosswalks, rectangular rapid flashing beacons, bike signal detection, solar USB charging benches.

- **Call/Meet with GDOT Operations to Discuss Process for Utilizing Contract Catalog for Eligible Phase 1D Projects.**
  - The following projects within Phase 1D are included in GDOT’s contract catalog: rectangular rapid flashing beacons and bike signal detection.

- **Call/Meet with GDOT D7 State Aid Coordinator to Discuss OSS Funding.**
  - Locals are required to contact District Aid Coordinator by the end of the year (12/31/19) in order to potentially access OSS funds for current fiscal year (by 9/30/20). May be needed to supplement GTIB funding or as a back-up plan.

- **Meet with Vendor(s) and City of Hapeville for Phase 1B Project (Digital Wayfinding Kiosks).**
  - Determine timeline for implementation, including any City permitting requirements (none required by GDOT), roles and responsibilities.

- **Determine Interoperability of On-Board Units.**
  - Meet with vendor(s) for CV1k+ Initiative to determine if on-board unit for transit signal priority can also be used for transit pedestrian warning systems.
Available Online
https://aerocids.com/projects/the-smart-corridor/
QUESTIONS?
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